

a' comprising 5 micron nylon particles (ORGASOL 2001 UD available from Elf Atochem, Philadelphia, PA); 6.25% texture-producing particles comprising 60 micron nylon 12 particles (ORGASOL 2002 ES 6 available from Elf Atochem, Philadelphia, PA); 2.00% alumina RCA having a particle size distribution in the range of 27-56 nm (NANOTEK ALUMINA #0100 available from Nanophase Technologies Corp. Burr Ridge, IL); and 0.31% prehydrolyzed silane as an RCA coupling agent comprising 0.21% 3-methacryloxypropyltrimethoxysilane (Z-6030 available from Dow Corning, Midland, MI), 0.015% glacial acetic acid, 0.015% deionized water, and 0.07% ethanol, prehydrolyzed as described in Example 1 below. --

Please replace the paragraph beginning at page 13, line 5, with the following:

a² 001210 0245450
-- A preferred embodiment of a cured coating mixture of the present invention is a cured coating made from a pre-cured coating mixture comprising, by weight, 79.44% of a resin mixture comprising, by weight, 53.4% urethane acrylate (ALUA 1001, available from Congoleum Corporation, Mercerville, NJ), 8.8% ethoxylated diacrylate (SR 259 available from Sartomer, Exton, PA), 24.3% propoxylated diacrylate (SR 306 available from Sartomer, Exton, PA), 13.4% ethoxylated trimethylolpropane triacrylate (SR 454 available from Sartomer, Exton, PA), and 0.1% acylphosphine oxide (LUCERIN TPO available from BASF); 12.00% flatting agent comprising 5 micron nylon particles (Orgasol 2001 UD available from Elf Atochem, Philadelphia, PA); 6.25% texture-producing particles comprising 60 micron nylon 12 particles (ORGASOL 2002 ES 6 available from Elf Atochem, Philadelphia, PA); 2.00% nanometer-sized alumina RCA having a particle size distribution in the range of 27-56 nm (NANOTEK ALUMINA #0100 available from Nanophase Technologies Corp. Burr Ridge, IL); and 0.31% prehydrolyzed silane as an RCA coupling agent comprising 0.21% 3-methacryloxypropyltrimethoxysilane (Z-6030 available from Dow Corning, Midland, MI), 0.015% glacial acetic acid, 0.015% deionized water, and 0.07% ethanol, prehydrolyzed as described in Example 1 below.--

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Please replace the paragraph beginning at page 17, line 12, with the following:

— EXAMPLE 1

A4 This example describes a microscopic texture with good abrasion resistance, but poor cleanability. 60g of alumina (available as NANOTEK ALUMINA 0100 from Nanophase Technologies Corp., Burr Ridge, IL) having an average particle diameter range of 27-56 nm, 7.92g of prehydrolyzed 3-methacryloxypropyltrimethoxysilane (available as Z-6030 from Dow Corning, Midland, MI), 240g of a UV-curable resin (see Table 1 below for the resin composition), and about 200g of 0.5 in. diameter porcelain balls were added to a porcelain media mill. —

A5 007214 02463760 Please replace the paragraph beginning at page 18, line 1, with the following:

-- Table 2: UV-Curable Resin Composition

Component	Manufacturer	Wt %
Urethane acrylate (ALUA 1001)	Congoleum (Mercerville, NJ)	53.4
Ethoxylated diacrylate (SR 259)	Sartomer (Exton, PA)	8.8
Propoxylated diacrylate (SR 306)	Sartomer (Exton, PA)	24.2
Ethoxylated trimethylolpropane triacrylate (SR 454)	Sartomer (Exton, PA)	13.3
Surfactant (DC 193)	DOW Corning (Midland, MI)	0.1
Acylphosphine oxide (LUCERIN TPO)	BASF	0.2

Please replace the paragraph beginning at page 18, line 17, with the following:

— EXAMPLE 2

A6 This example shows a coating with macroscopic texture having good cleanability and scratch resistance. 31.17g of silica (available as NANOTEK SILICA 2000 from Nanophase Technologies Corp., Burr Ridge, IL) having an average particle diameter range of 15-33 nm, 10.51g of prehydrolyzed

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3-methacryloxypropyltrimethoxysilane (available as Z-6030 from Dow Corning, Midland, MI) prepared as described in Example 1, 100g of a UV-curable resin (see Table 2 below for resin composition). The mixture was hand stirred with a wooden spatula and then mixed with an ultrasonic probe for about 20 minutes. The pre-cured coating mixture was applied to flexible polyvinyl chloride floor substrates at room temperature with a spatula and distributed on the substrate with an air knife. These sheet vinyl substrates were then UV-cured under nitrogen (<500 ppm oxygen) using two H-bulbs set on high and a line speed of 100 fpm. Two passes under the lamps were made under these conditions. The resulting coating was transparent with a gloss value (at 60°) of about 11%. The coating also had a macroscopic wave-like texture and was found to be cleanable. A Taber scratch test consisting of scribing 5 concentric circles on the coated samples with a metal stylus weighted from 300 to 500g in 50g increments yielded no visible scratches on the coating surface. Using the qualitative scratch rating system, this coating was rated a 7. —

Please replace the paragraph beginning at page 19, line 1, with the following:

—Table 2: UV-Curable Resin Composition

Component	Manufacturer	Wt %
Urethane acrylate (ALUA 1001)	Congoleum (Mercerville, NJ)	53.4
Ethoxylated diacrylate (SR 259)	Sartomer (Exton, PA)	8.8
Propoxylated diacrylate (SR 306)	Sartomer (Exton, PA)	24.2
Ethoxylated trimethylolpropane triacrylate (SR 454)	Sartomer (Exton, PA)	13.3
Surfactant (DC 193)	DOW Corning (Midland, MI)	0.1
Acylphosphine oxide (LUCERIN TPO)	BASF	0.2

Please replace the paragraph beginning at page 19, line 22, with the following:

— EXAMPLE 4

Tests were conducted to determine the effects of silane as a coupling agent on the dispersion of nanometer-sized alumina. 2g of NANOTEK ALUMINA 0100 having an average particle diameter range of 27-56 nm was added to 10g of each of the following liquids: ethoxylated diacrylate (available as SR 259 from Sartomer, Exton, PA), propoxylated diacrylate (available as SR 306 from Sartomer, Exton, PA), ethoxylated trimethylolpropane triacrylate (available as SR 454 from Sartomer, Exton, PA), and urethane acrylate (available as ALUA 1001 from Congoleum, Mercerville, NJ). The mixtures were stirred, shaken, and then placed into an ultrasonic bath for 30 minutes. To some of these mixtures 0.24g prehydrolyzed silane, as prepared in Example 1, was added, and the mixture was stirred. The consistencies of each of these mixtures are described in the Table 3 below. —

Please replace the paragraph beginning at page 20, line 1, with the following:

— Table 3: Effects of Prehydrolyzed Silane

Liquid	Dispersing Agent	Observations
SR 306	none	thixotropic paste
	silane	low viscosity liquid
SR 259	none	low viscosity liquid
	silane	low viscosity liquid
SR 454	none	thixotropic paste
	silane	low viscosity liquid
ALUA 1001	none	non-thixotropic cream
	silane	low viscosity liquid

Please replace the paragraph beginning at page 28, line 3, with the following:

→ EXAMPLE 12

C10
This example demonstrates the use of an organic RCA. 20g of an organic (castor wax derivative) RCA THIXIN R (Rheox Inc., Hightstown, NJ) was added to 480g of the pre-cured UV resin described in Table 2 and mixed with a Cowles blade mixer. The mixture was then heated at 70°C until the THIXIN R dissolved. The mixture was then allowed to cool to room temperature. The viscosity of this mixture at a shear rate of 0.150 s⁻¹ at room temperature was 243,000 cPs. This mixture was then coated on flexible sheet vinyl using an air knife and cured under inert conditions. The resulting cured coating was transparent and had a wave-like macroscopic texture. When scratched using the Taber scratch test, no visible scratches were observed. →

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Please replace the paragraph beginning at page 28, line 14, has been amended as follows:

— EXAMPLE 13

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This example demonstrates the use of both an organic RCA and an inorganic flatting agent. 12g of THIXIN R organic RCA and 19.14g of ACEMATTE OK 412 (Degussa Corp.) silica flatting agent were added to 288g of the pre-cured UV resin described in Table 2 and mixed as in Example 12. This mixture was coated on a flexible vinyl sheet floor with an air knife and cured under both atmospheric and inert conditions. The resulting coating had a matte finish and wave-like texture. —

Please replace the paragraph beginning at page 28, line 22, with the following:

— EXAMPLE 14

C12
This example shows that wave-like macroscopic texture can be generated without the use of an RCA. 85.25g of Alua 2302 and 21.31g ALUA 1001 urethane acrylate oligomers (Congoleum Corp., Mercerville, NJ), 66.14g of ACTILANE 424 and 26.64g of ACTILANE 430 acrylate monomers (Akcros Chemicals, New Brunswick, NJ), 0.2g DC 193 surfactant, and 0.394g of LUCERIN TPO photoinitiator were added to a container at room

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A12 temperature. This mixture was heated to 70°C and mixed with a Cowles blade mixer. After cooling to room temperature, the pre-cured coating mixture was applied to flexible vinyl substrates, coated with an air knife, and UV-cured under inert conditions. The resulting coating was transparent and had macroscopic wave-like texture. —

Please replace the paragraph beginning at page 28, line 33, with the following:

— EXAMPLE 15

A13 This example demonstrates the use of organic texture-producing particles and an inorganic flatting agent. 6.25g of ORGASOL 2002 ES 6 NAT (Elf Atochem, Philadelphia, PA) polyamide 12 texture-producing particle (60 μ m in diameter) and 5.625 g of ACEMATTE OK 412 flatting agent (3 μ m diameter) were added to 88.125g of the pre-cured UV-resin described in Table 2 and mixed with a Cowles blade mixer. This mixture was heated to 70°C and coated on a flexible sheet vinyl floor using an air knife. The pre-cured coating was cured at a line speed of 100 fpm using atmospheric and then inert conditions. The resulting coating was transparent coating with a matte finish and sandpaper-like texture. —

Please replace the paragraph beginning at page 29, line 6, with the following:

— EXAMPLE 16

A14 This example shows the effects of the size of the texture-producing particles on the cured coating texture. Four pre-cured coating mixtures were prepared as in Example 15 where 6.25% of ORGASOL 2002 polyamide 12 texture-producing particles was added to the pre-cured UV-resin described in Table 2. The four mixtures differed in that each contained a different sized particle of ORGASOL 2002: 30 μ m (grade ES 3), 40 μ m (grade ES 4), 50 μ m (grade ES 5), and 60 μ m (grade ES 6). Each mixture was applied at 70°C to sheet vinyl and coated with an air knife. All coatings were UV-cured under inert conditions. The cured coating containing the 30 μ m particles had a visibly fairly smooth surface with a matte finish. The coatings with the larger particles had progressively more visible texture as the particle size increased, where the 60 μ m particles gave the most visible and aggressive (largest textural features) texture. The scratch resistance of the coatings improved with

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increasing particle size, where 60 μm showed almost no visible scratches after the Taber scratch test. FIG. 9 is a photograph of the top of a portion of the coated substrate produced using the 60 μm particles, and FIG. 10 is a photograph of the top of a portion of the coated substrate produced using the 40 μm particles. The difference in the aggressiveness of the texture is evident. It should be appreciated, however, that the concentration of particles used would also be expected to have an influence on textural aggressiveness.—

Please replace the paragraph beginning at page 30, line 16, with the following:

—EXAMPLE 17

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004250 02453450
This example describes textured coatings containing organic texture-producing particles, an inorganic RCA with a coupling agent, and both organic and inorganic flatting agents. Per-cured coating mixtures having the composition shown in Table 9 were mixed with a Cowles blade mixer.

Table 9: Pre-Cured Coating Mixture Compositions in Weight Percent

Component	Coating A	Coating B
UV-Curable Resin from Table 2	85.62	85.95
ORGASOL 2002 ES 6 (60 μm texture-producing particle)	6.12	6.25
ORGASOL 2001 UD (5 μm organic flatting agent)	6.0	0
ACEMATTE OK 412 (3 μm inorganic flatting agent)	0	5.49
NANOTEK ALUMINA (inorganic RCA)	1.96	2
Prehydrolyzed Z-6030 (coupling agent from Example 1)	0.30	0.31

Both coatings were applied to flexible sheet vinyl at 70°C and coated with an air knife. These coated substrates were UV-cured under atmospheric and then inert environments. The resulting cured coatings were transparent and had sandpaper-like macroscopic texture and matte finishes.—